



Four Phases of Sorghum Research

Research funded by producer dollars is designed to make sorghum production more profitable for growers now and in the long run. The United Sorghum Checkoff Program (USCP) Board funded substantial research in 2009, and projects, in four phases, have been selected throughout sorghum country.

Helpful Handbooks

Using checkoff funds, agronomists are compiling the best production practices into regional handbooks designed as ready reference tools, to help sorghum growers be more efficient. This is Phase One of the checkoff-sponsored research.

Scheduled for publication this winter, the regional handbooks will also be posted at www.sorghumcheckoff.com, where they will be updated with new information, such as best management practices for over-the-top weed control chemicals when these become available.

How It's Done

Phase Two of funded research was designed to establish demonstration plots in fields. Six funded projects include putting out more hybrid trials for producers to see, making the most of irrigation technology and demonstrating new over-the-top weed control.

USDA-ARS in Lubbock, Texas is working to optimize irrigation technology in sorghum. Irrigated sorghum has lost acres in some areas as the cost of water has risen. Sensor technology would allow farmers to irrigate when the plant most needs it and raise profit margins by combining good yield potential with timely, proper irrigation.

Kansas State University is demonstrating over-the-top weed control technology with help from scientists in several states. The technology, not yet commercially available, promises to add efficiency and reduce costs for weed control in sorghum as it has in corn, yet scientists warn that it must be carefully managed to remain effective.

The Basics

Phase Three concerns more basic research in the areas of cold and drought tolerance, conversion of exotic sorghums into ones that will flower in U.S. fields, best fertilization practices in forage sorghums and developing hybrids better suited for bioenergy.

Two cold tolerance studies could have tremendous impact on sorghum production. Sorghum typically isn't very vigorous in soils below 55 degrees, unlike corn, whose cold tolerance gives it a longer growing season associated with higher yields.

A private seed company, Advanta, is working with USDA-ARS to move cold-tolerance technology out to producers as soon as possible. Also, scientists at Purdue University are developing genetic markers for cold tolerance, which could really improve the ability to move this trait into sorghum faster.

USDA-ARS in Lubbock and the University of Georgia are working on drought tolerance. ARS is developing lab screening technologies, and Georgia is working on gene identification and marker development. What these researchers find should allow companies to tag genes important to drought tolerance and move them more rapidly into hybrid lines for producers.

Another joint private-public project will help convert exotic sorghum germplasm into sorghums that are not sensitive to day length. This conversion will let these tropical sorghums be grown, evaluated, screened and developed into new hybrids here in the United States. MMR Genetics and USDA-ARS are collaborating and will release new converted lines to private and public researchers, who will be able to move new genetics into inbred lines and help improve our yields through better hybrids, new pest and insect disease and new combination of genes.

Researchers in Arizona are attempting to optimize fertilization rates for forage sorghum hybrids, and scientists at Texas A&M University and the National Renewable Energy Lab are doing work that should improve forage sorghum's usefulness as ethanol feedstock.

Leveraging Farmer Funds

The fourth and last group of research projects for 2009 covers long-term work such as new uses for sorghum and developing genomic tools in the crop.

Scientists at the University of Nebraska, Texas A&M, Kansas State and ARS are studying the health benefits of sorghum in food products, such as the glycemic index, gluten-free flour and antioxidant properties of the grain.

“We hope to build on these projects and leverage bigger funding through organizations such as the National Institutes of Health, because these studies can only be completed with large amounts of money,” says Jeff Dahlberg, USCP Research Director.

Other projects, at Kansas State and Texas A&M University, seek to use dried distillers grains (DDGs) from sorghum to make unique adhesives and other products.

Other futuristic work concerns basic genomics research, so in the future we can take advantage of the sorghum genetic sequence that has been completed. Yet another project will develop and characterize mutations in sorghums.

“In the future, we'll make progress in sorghum by knowing how genes act on biochemical pathways that lead to such things as drought, insect and disease tolerance,” Dahlberg says. “Our crop can be a model for cereal crop improvement in the future.”

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